

AERODYNAMICALLY LIGHT PARTICLES FOR
PULMONARY DRUG DELIVERY

ABSTRACT OF DISCLOSURE

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Improved aerodynamically light particles for delivery to the pulmonary system, and methods for their preparation and administration are provided. In a preferred embodiment, the aerodynamically light particles are made of a biodegradable material and have a tap density less than 0.4 g/cm^3 and a mass mean diameter between $5 \text{ }\mu\text{m}$ and

10 $30 \text{ }\mu\text{m}$. The particles may be formed of biodegradable materials such as biodegradable polymers. For example, the particles may be formed of a functionalized polyester graft copolymer consisting of a linear α -hydroxy-acid polyester backbone having at least one amino acid group incorporated herein and at least one poly(amino acid) side chain extending from an amino acid group in the polyester backbone. In one embodiment,

15 aerodynamically light particles having a large mean diameter, for example greater than $5 \text{ }\mu\text{m}$, can be used for enhanced delivery of a therapeutic or diagnostic agent to the alveolar region of the lung. The aerodynamically light particles optionally can incorporate a therapeutic or diagnostic agent, and may be effectively aerosolized for administration to the respiratory tract to permit systemic or local delivery of a wide

20 variety of incorporated agents.

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